



DoD Sustainable Buildings

Col Bart Barnhart
ODUSD(I&E)
May 12, 2011



Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 12 MAY 2011		2. REPORT TYPE		3. DATES COVERED 00-00-2011 to 00-00-2011	
4. TITLE AND SUBTITLE DoD Sustainable Buildings				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Office of the Deputy Under Secretary of Defense (Installations & Environment), 3400 Defense Pentagon, Room 3B856A, Washington, DC, 20301-3400				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the NDIA Environment, Energy Security & Sustainability (E2S2) Symposium & Exhibition held 9-12 May 2011 in New Orleans, LA.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 13	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



DoD Sustainable Buildings Overview

- **Sustainability Drivers**
- **Green Building Requirements**
- **Challenges**



Sustainability Drivers

Federal

➤ Executive Order 13514

- ♦ President's vision: ... *create clean **energy** economy ... promote **energy** security ... safeguard environment ...*
- ♦ Centerpiece goal: Reduce GHG emissions (3 goals)
- ♦ Other goals: **High performance bldgs**, water efficiency, **energy** efficiency, renewable **energy**, waste reduction, master planning, EMS, sustainable acquisition, electronics stewardship

➤ **Energy** Independence & Security Act (EISA) of 2007

- ♦ §431 – Reduce **energy** use 30% by 2015 (2005 baseline)
- ♦ §432 – **Energy**/water eval every 4 years
- ♦ §433 – Fossil fuel **energy** use eliminated by 2030

➤ **Energy** Policy Act (EPAct) of 2005

- ♦ §103 – 100% of fed bldgs metered (**electricity**) by Oct 1, 2012
- ♦ §109 – Bldg **energy** performance 30% better than ASHRAE
- ♦ §203 – Renewable **energy** targets – 7.5% by FY2013



Thursday,
October 8, 2009

Federal Register

Part VII

The President

Executive Order 13514—Federal
Leadership in Environmental, Energy,
and Economic Performance

EO 13514



PUBLIC LAW 110-140 – DEC. 19, 2007

ENERGY INDEPENDENCE AND
SECURITY ACT
OF 2007

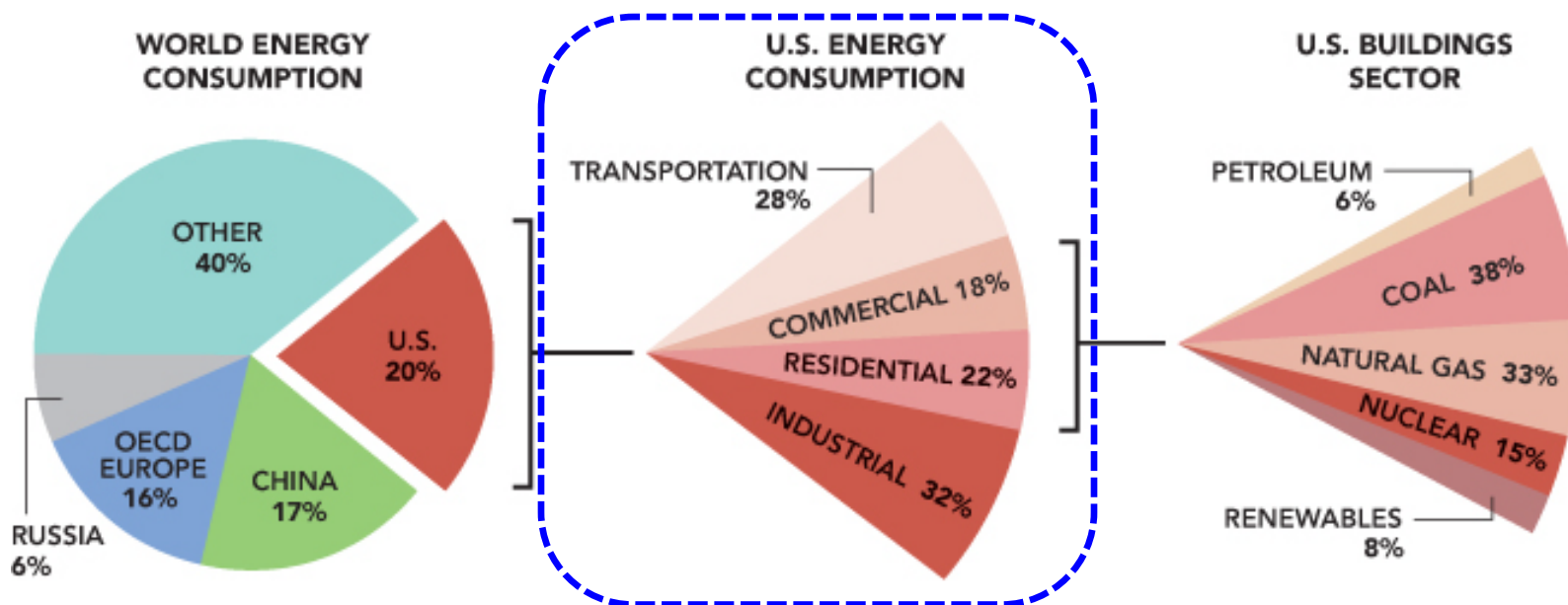


Sustainability Drivers

Building Energy Consumption

➤ U.S. Energy Use – GHG Emissions Relationship

- ◆ Building Sector consumes 40% of all energy in the U.S.
- ◆ Industrial Sector – 32%, Transportation Sector – 28%



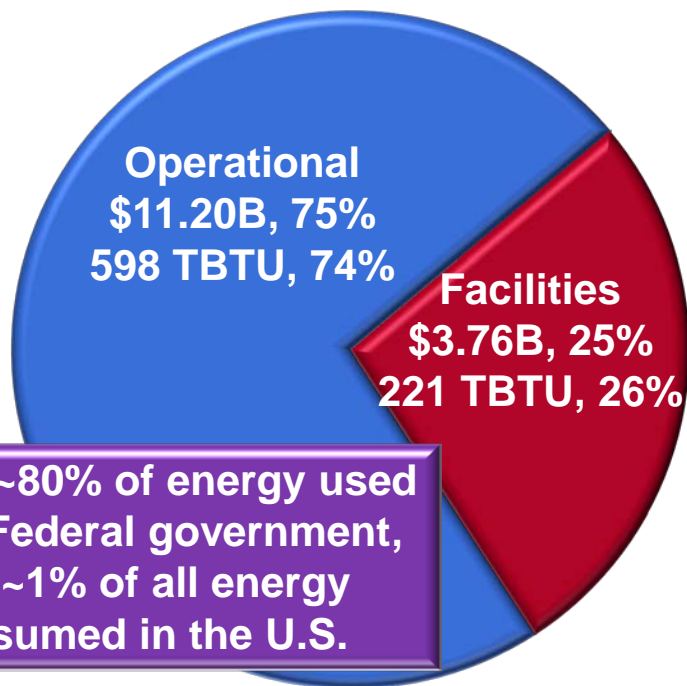
- ◆ Building Sector energy use results in ~54% of U.S. GHG emissions



Sustainability Drivers

DoD Energy Use, FY10

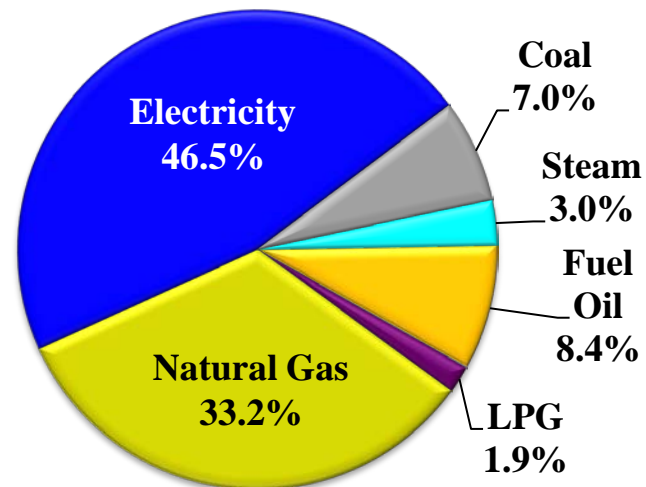
2010 DoD Overall Energy Consumption



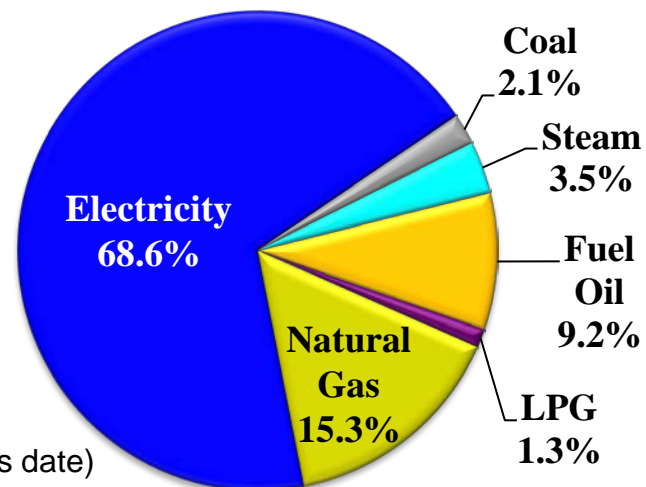
This is ~80% of energy used by the Federal government, and ~1% of all energy consumed in the U.S.

Overall DoD Energy Cost
\$11.20B Operational
\$ 3.76B Facilities
\$ 0.25B Fleet vehicles
\$15.21B TOTAL

Facilities Energy Consumption



Facilities Energy Cost



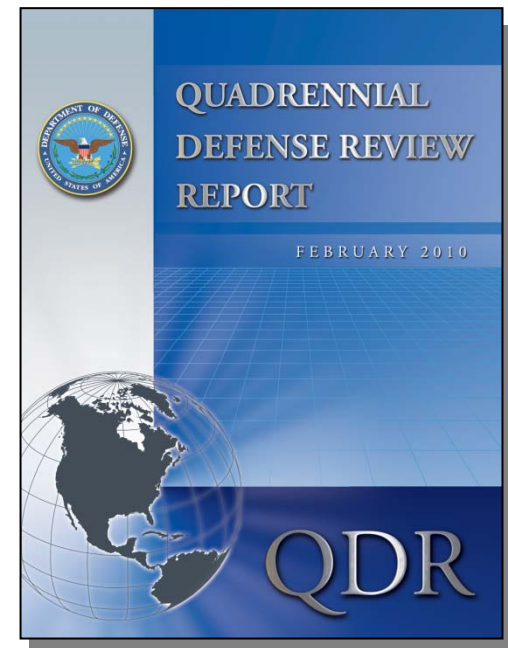


Sustainability Drivers

DoD

➤ QDR and Defense Planning Guidance (DPG) define DoD future focus & funding priorities

- ◆ Increase energy security
- ◆ Increase facility energy efficiency
- ◆ Increase water use efficiency
- ◆ Reduce “fully burdened cost of fuel” (FBCF)
 - Key Performance Parameter for energy efficiency



The QDR sets key priorities for capability development & investment, and communicates SecDef’s intent for the next several years

The DPG is SecDef’s goals, priorities, and objectives, including fiscal constraints for development of budget requirements by the Military Departments & Defense Agencies



Sustainability Drivers

Federal – DoD Linkage

- **EO 13514** required federal agencies to write a **Strategic Sustainability Performance Plan**
 - ◆ DoD's **SSPP** publicly released August 26, 2010
 - ◆ Updated annually, next update due in June 2011
- **SSPP** consolidates **EO, EISA, EPAct** rqmts
 - ◆ **SSPP** features 21 performance-based sub-goals
 - ◆ Most goals were tracked pre-EO 13514
- **DoD Sustainable Buildings Policy, Oct 2010**
 - ◆ Build to **LEED-Silver** (or equivalent) *and* Guiding Principles
 - ◆ **40%** of LEED points from energy/water



Department of Defense
Strategic Sustainability Performance Plan

FY 2010

Public Version
26 August 2010



OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

OCT 25 2010

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY
(INSTALLATIONS, ENERGY AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE NAVY (ENERGY,
INSTALLATIONS AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE AIR FORCE (INSTALLATIONS,
ENVIRONMENT AND LOGISTICS)
DIRECTORS OF DEFENSE AGENCIES
DIRECTOR, WASHINGTON HEADQUARTERS SERVICES

SUBJECT: Department of Defense Sustainable Buildings Policy

It is DoD policy to build, operate, maintain, reuse, demolish or deconstruct DoD buildings in a sustainable manner, as outlined by DoDI 4170.11 and Unified Facilities Criteria 4-030-01. This memo establishes supplementary Department policy on sustainable buildings and specifies DoD Component actions necessary for compliance. Specifically:

(1) All new building design and construction shall conform to the guiding principles in the High Performance and Sustainable Buildings MOU (attached). Also, DoD Components will design and build, and certify as appropriate, all new construction projects, at a minimum, to the Silver level of the Leadership in Energy and Environmental Design (LEED) green building rating system (or equal). Beginning in FY12 for projects in the planning stage, the sum of energy and water efficiency credits shall equal or exceed 40% of the points required for a LEED-Silver (or equal) rating; this highlights the importance of pursuing additional energy- and water-related credits in areas such as cool roofs and day lighting.

(2) All repair/renovation projects in existing buildings shall also conform to the guiding principles where they apply. The DoD Components will design, execute and certify major repair/renovation projects to be LEED Silver, at a minimum, where appropriate.

(3) Reduced total cost of ownership is intrinsic to sustainable buildings. The DoD Components shall incorporate life cycle and cost/benefit analysis into design decisions for new construction and renovation/repair projects.

Each DoD Component is responsible to form guidance in support of this policy. My point of contact is Col Bart Barnhart, at (703) 604-1831 and barnhart@osd.mil.

Dorothy Robyn
Deputy Under Secretary of Defense
(Installations & Environment)

Attachment:
As stated



Sustainability Drivers

DoD Mission Linkage

➤ Sustainable buildings increase *energy security*, enhance operational capability

- ♦ Energy efficient installation + suitable renewable energy generation = less grid dependency = more *energy security*
 - *Energy security* assures warfighter reachback
- ♦ Energy efficient installation + suitable renewable energy generation = reduced energy bill = more \$ available for “tooth”
 - More \$ available for “tooth” = enhanced operational capability

➤ Sustainable systems reduce DoD operational risk

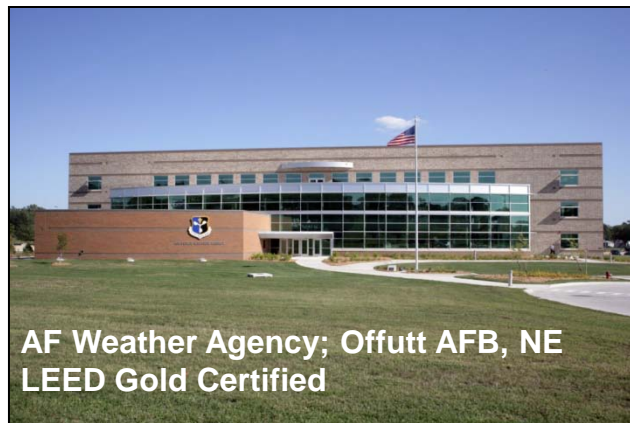
- ♦ Low fuel appetite = Fewer convoys; Fewer convoys = Less operational risk
- ♦ *Fully burdened cost of fuel (FBCF)* affects funds available for operations
 - Cost to get fuel to fight; up to \$400/gal
 - Iraq, May 08; 44 tankers, 220Kgal lost to insurgent attacks
- ♦ Energy efficiency Key Performance Parameter will reduce FBCF over time





Green Building Requirements

EO 13514 – driven



- **Reduce GHG emissions (34% by end of FY20)**
 - ◆ **Reduce facility energy consumption 37.5% by end of FY20 (2003 baseline)**
- **15% of DoD bldgs (>5ksf) conform to **Guiding Principles** (GP's) by FY15**
 - ◆ **75k bldgs x 15% = 11.4k bldgs**
 - ◆ **Bldg must meet all five **GP's** to conform**
 - ◆ **Pushes whole bldg renovations**
- **EO directs continual progress to **GP** conformance for 100% of DoD bldgs**
 - ◆ **307k DoD bldgs – 75% of federal bldg inventory**
- **Beginning in 2020, all newly planned Federal bldgs designed for net-zero energy consumption**





Green Building Requirements

The Guiding Principles (GP's)

➤ The 5 GP's

- ◆ Employ Integrated Design Principles
- ◆ Optimize Energy Performance
- ◆ Protect and Conserve Water
- ◆ Enhance Indoor Environmental Quality
- ◆ Reduce Environmental Impact of Materials

➤ LEED categories

- ◆ Sustainable Sites
- ◆ Energy and Atmosphere
- ◆ Water Efficiency
- ◆ Indoor Environmental Quality
- ◆ Materials and Resources

-
- The GP's and LEED ... similar, only different
 - Meeting GP's not enough to earn a LEED rating;
earning a LEED rating does not make you GP compliant
 - DoD will do BOTH (GP's & LEED) for new construction
 - ◆ Caveat: DoD *does not* set a standard for % of LEED certified buildings

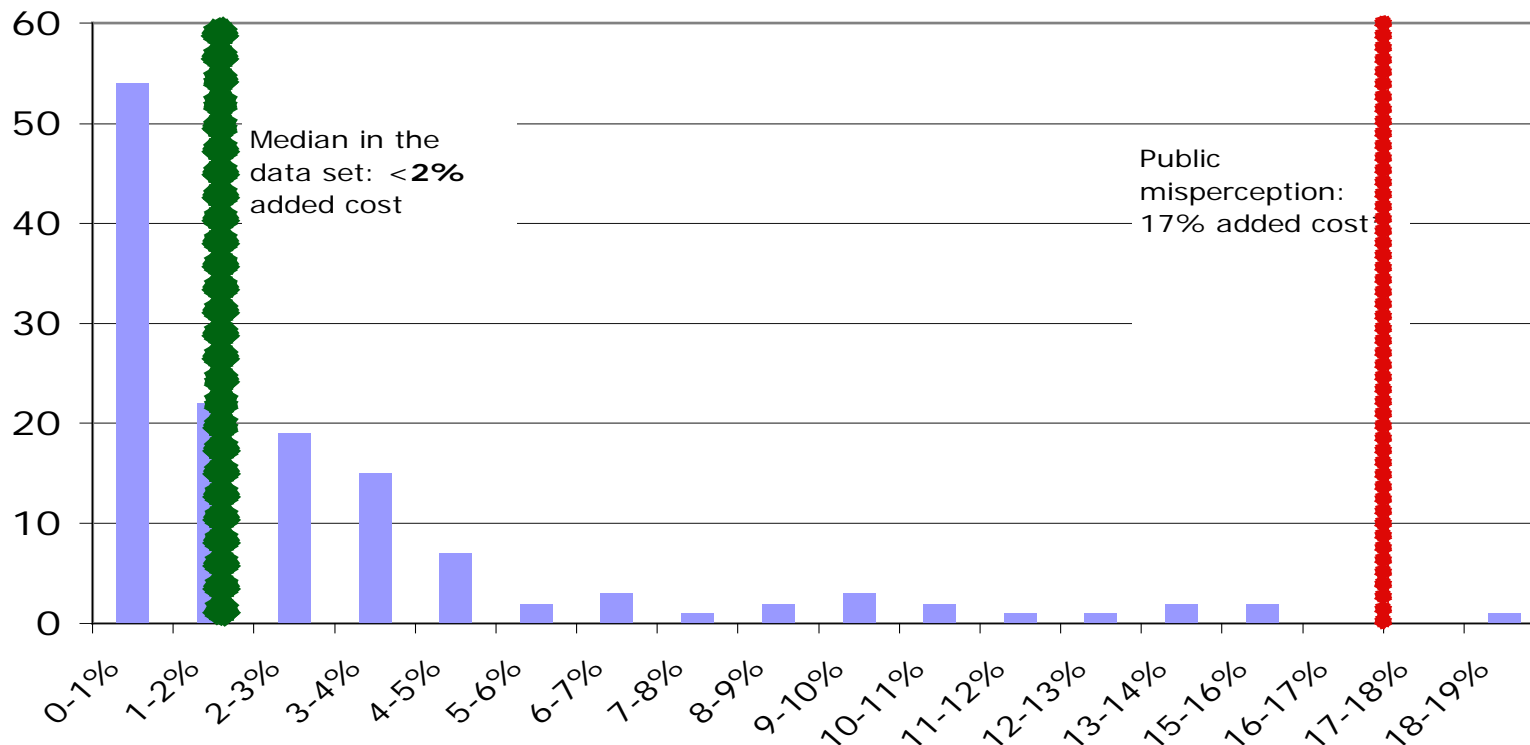
There is no mention of LEED in Federal guidance!!



Challenges

Cost of Building Green

Additional cost to build green: Evidence from 146 green buildings



*2007 opinion survey by World Business Council for Sustainable Development

Range of reported premiums



Challenges

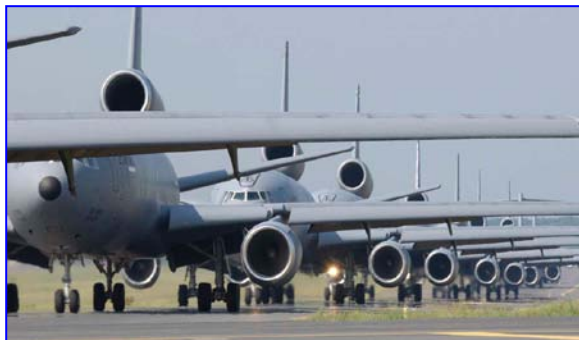
- **Spend a little more up front to save a lot more later**
- **Mil Depts funding sustainment at 80-90% level**
 - ◆ **Tough to operate buildings at designed performance parameters**
- **Training our “sustainability practitioners”**
 - ◆ **Keep building systems at peak performance, or life-cycle cost savings estimates do not happen**
- **Start making Net-Zero energy buildings a reality NOW !!!**





Questions

Sustainability



Contact Info:

Col Bart Barnhart

ODUSD(I&E)

(703) 604-1831

barton.barnhart@osd.mil